

The cardiac sonography workforce in New Zealand

Abstract

Introduction: The aim of this paper is to investigate the cardiac sonography workforce characteristics and registration requirements in New Zealand (NZ), with a comparison to similar workforces internationally.

Methods: The Survey of Clinical Echocardiography in New Zealand 2 (SCANZ2) audit was performed in December 2010. All of NZ's public-funded District Health Board (DHB) centers providing echocardiography services responded to questions relating to staff, equipment, procedure types and patient statistics. The Medical Radiation Technologists Board (MRTB), Clinical Physiologists Registration Board (CPRB) and Australian Sonographers Association Registry (ASAR) websites were reviewed in March 2012 for registered sonographers with a cardiac scope of practice. The cardiac sonography workforces in Australia, the UK, the USA and Canada were investigated for comparison.

Results: There are 84 cardiac sonographers (60.3 full-time equivalent) working in DHBs: 71% from a cardiac technical background; 40% have post-graduate qualifications; a further 17% are undertaking post-graduate qualifications; and 59 cardiac sonographers have registration with professional bodies in NZ and/or Australia. Cardiac sonographers in NZ do not undergo compulsory registration, but other sonographers in NZ have compulsory registration with the MRTB. Sonographers are predominantly not licensed internationally.

Discussion: Disparity exists between registration of cardiac and non-cardiac sonographers in NZ. Many cardiac sonographers have voluntary registration but few are registered with the MRTB. Reasons for this include professional alignment, educational qualifications and representation. International trends show increased pressure from governments and professional bodies to regulate sonographers.

Conclusion: This study provides a snapshot of the cardiac sonography workforce in NZ for the first time.

Keywords: background, cardiac sonographer, registration, workforce.

Background

Cardiac sonographers are healthcare professionals with a high level of skill and responsibility since the depth and breadth of the examination performed is reliant on the diagnostic decisions the sonographer makes during the scan.¹ In Australia, the United Kingdom (UK), Canada and the United States of America (USA) cardiac sonography is recognised as a speciality of sonography. In New Zealand there is a well-defined sonography scope of practice² but no recognition of separate sonography specialities.

Echocardiography first began to be practised within New Zealand over 35 years ago and is now widely available throughout the country in both the public and private sector. In NZ, the provision of echocardiography services was first documented in 2005 through the Survey of Clinical Echocardiography in New Zealand (SCANZ) audit³ but there has been no investigation of the profession of cardiac ultrasound or of the cardiac sonographers who perform this role. The repeat of this national audit in 2010, SCANZ2, offered

an opportunity to investigate the profession of cardiac ultrasound and the cardiac sonographer workforce.

The aim of this paper is to investigate the cardiac sonography profession and workforce in NZ specifically related to workforce size, professional and educational background and the role performed. In addition registration status will be investigated with a comparison to similar workforces internationally.

Methods

Data sources

The SCANZ2 national audit was distributed in December 2010 to all public health or District Health Board (DHB) centres providing echocardiography services in NZ. Of all echocardiograms performed in NZ, 79% are provided through the DHB system,¹ and all acute echocardiograms are performed within this system. The SCANZ2 audit was a follow-up to the 2005 SCANZ audit and was primarily designed to assess the number of examinations performed

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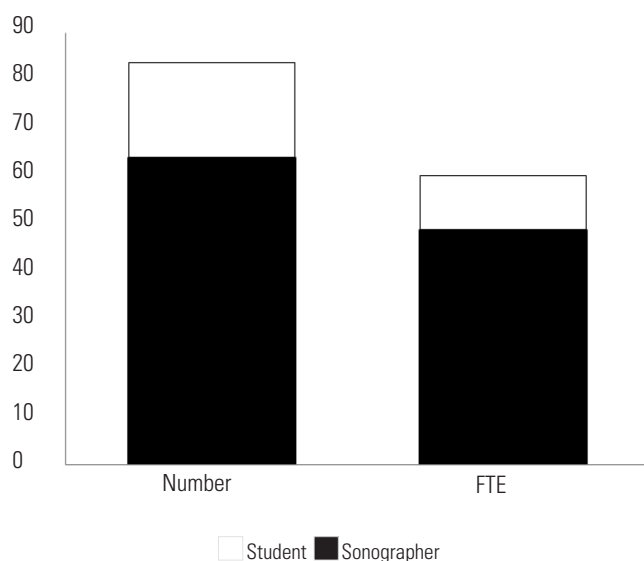
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Cardiac Sonographer Workforce size NZ



Abbreviation: FTE = full-time equivalent

Black bars represent qualified cardiac sonographers, white bars represent trainees

Figure 1: Cardiac Sonographer Workforce in NZ, from Magann, *et al.*². Comparison of normal amniotic fluid volumes (dye determined or directly measured) across gestation: Brace and Wolf,⁴¹ Magann, *et al.*⁴² and Queenan, *et al.*²⁶

regionally. Audit questions were related to staff and equipment resource as well as procedure types and annual statistics from 2005 to 2009. The audit was answered by a single responder for each site.

The Medical Radiation Technologists Board (MRTB) website was reviewed for registered sonographers with a cardiac scope of practice.² The Clinical Physiologists Registration Board (CPRB) website lists registered practitioners³ without scope detail but this information was obtained upon request. In addition, the Australian Sonographers Association Registry (ASAR) was reviewed for registered practitioners⁴ with a cardiac scope in NZ.

Publications and public-access websites were searched for information regarding the cardiac sonography workforces in Australia, the UK, the USA and Canada and investigated for similarities and differences to the NZ cardiac sonography workforce.

Data analysis

All twenty of the larger regional centres responded (Appendix 1). There were an additional eight smaller centres (Appendix 2) staffed by sonographers from the larger centres and not included separately. The audit information was entered into an electronic database and rechecked for accuracy. Data from each hospital centre was separated into tables representing information on sonographers, consultants, equipment, statistics and general information. Information relating to sonographer staff resources from multi-centre sites was not duplicated in the spreadsheets.

The number of sonographers with a cardiac scope of practice in NZ with the MRTB, CPRB and ASAR were identified.

Table 1: Professional background of cardiac sonographers.

	Cardiac sonographer number (%)
Cardiac technical	60 (71%)
Other Cardiology	3 (3.6%)
Radiology	6 (7.1%)
Nurse	1 (1.2%)
Unknown	14 (16.7%)

Table 2: Professional qualifications of cardiac sonographers.

	Cardiac sonographer number (%)
DMU (Cardiac)	22 (26.1%)
DMU (Cardiac) student	12 (14.3%)
QUT-PGD	12 (14.3%)
QUT-PGD student	2 (2.4%)
No echo qualification	8 (9.5%)
Overseas echo	12 (14.3%)
Unknown	16 (19.0%)

Abbreviations: DMU- Diploma in Medical Ultrasound (cardiac), QUT-PGD – Queensland University of Technology Postgraduate Diploma Cardiac Ultrasound

Results

Workforce size

There were 84 cardiac sonographers working in DHBs nationally, 20 (24%) were identified as students, resulting in a total full time equivalent (FTE) workforce of 60.3. At the time of the audit, vacancies were reported at 9.5% of the total workforce (8 sonographers, 5.7 FTE) and not included in the total workforce number (Figure 1).

Professional background of cardiac sonographers

Sixty out of the 84 cardiac sonographers originated from a cardiac technical background; a further three had other (non-specified) cardiology related backgrounds; six cardiac sonographers had a background related to radiology professions; and one cardiac sonographer was a trained nurse. The professional background of 14 cardiac sonographers was not specified (Table 1).

Professional qualifications of cardiac sonographers

Thirty-four cardiac sonographers (40.4%) have post-graduate qualifications currently accepted for MRTB registration within NZ Diploma of Medical Ultrasound (DMU) Cardiac and Queensland University of Technology PG Diploma (QUT-PGD). There are an additional 14 (16.6%) who are undertaking DMU or QUT-PGD qualifications. Twelve cardiac sonographers (14%) have other international cardiac ultrasound qualifications. Qualification information was not provided for 16 (19%) (Table 2).

Registration status

There are 59 (70%) cardiac sonographers registered with professional representative bodies in NZ and Australia. The highest proportion is registered with the CPRB (30, 36%), followed by the MRTB (19, 23%), although many of these do not meet MRTB requirements. For example only nine sonographers

Table 3: Professional registration of cardiac sonographers.

	Number of cardiac sonographers	% of total cardiac sonographers
CPRB with APC	30	35.7%
MRTB with APC	9	10.7%
MRTB without APC	10	11.9%
ASAR only	10	11.9%
ASAR + MRTB	7	8.3%
ASAR + CPRB	1	1.2%

Abbreviation: CPRB – Clinical Physiologists Registration Board, MRTB – Medical Radiation Technologists Board, ASAR – Australian Sonography Accreditation Registry, APC – annual practicing certificate

(11%) meet current MRTB registration and annual practicing certificate (APC) requirements. There are two trainees registered with the MRTB (one with and one without an APC). Eighteen (21%) maintain registration with the ASAR, and some of these (eight, 9.5%) also hold registration with a professional body within NZ (Table 3).

The role cardiac sonographers perform in NZ

All DHBs perform adult transthoracic echocardiography (TTE), with 17 (85%) DHBs performing both adult and paediatric TTE scans. No DHBs performed only paediatric scans. Thirteen centres (65%) perform stress echo procedures (exercise stress and dobutamine stress). Fifteen (75%) of centres perform transoesophageal echocardiography (TOE) (Table 4).

Comparison of sonographer and medical radiation technologist (MRT) workforce in NZ and internationally

In NZ, non-cardiac sonographers and MRTs are able to register through the MRTB⁵; however cardiac sonographers do not have compulsory registration. In Australia, sonographers do not have compulsory legislative registration but do have compulsory accreditation with the Australian Sonographers Accreditation Registry (ASAR) when providing Medicare services.⁶ In comparison, medical radiation scientists (the equivalent of NZ's MRTs) begin compulsory registration under the National Registration and Accreditation Scheme (NRAS) from 1st July 2012.⁷ In the UK, sonographers do not need accreditation or compulsory registration to practice and voluntary accreditation is facilitated through The British Society of Echocardiography (BSE)⁸ and The Society of Radiographers (SOR).⁹ MRTs in the UK are called diagnostic or therapeutic radiographers¹⁰ and have compulsory registration in order to practice.¹¹ In the USA, sonographers in most states are not required by law to be accredited or credentialed and do not need compulsory registration to practice except in New Mexico and Oregon.¹² In the USA MRTs are called radiologic technologists¹³ and national licensing is not compulsory except in two states but most states are fully or partially licensed.¹⁴ In Canada, sonographers and MRTs are not licensed at a national level although regulations vary by province.¹⁵ The Canadian Association of Registered Ultrasound Professionals (CARDUP) runs voluntary certification for sonographers, a national registry and national competency profiles for each sonography speciality.¹⁵

Table 4: Procedure types performed nationally (across 20 sites).

	Number (%) of DHB sites
Adult TTE	20 (100%)
Paediatric TTE	17 (85%)
Foetal	3 (15%)
Dobutamine stress	13 (65%)
Exercise stress	13 (65%)
TOE	15 (75%)

Abbreviations: TTE – transthoracic echocardiogram, TOE – transoesophageal echocardiogram

In NZ, the UK and the USA the role description of an MRT includes the scope of sonography.^{10,13,16} In the UK and most states in the USA, MRTs have compulsory registration but sonographers are not required by law to register to practice. Only in NZ do both sonographers (excluding cardiac) and MRTs require legislative registration at a national level. Cardiac sonography is recognised as a specialty of sonography in Australia, the USA and Canada.^{6,17,18} In NZ there is one sonography scope, with an additional training sonography scope.¹⁶ Cardiac sonographers have a variety of job titles internationally, with sonographer and technologist being the most common (Table 5).

Discussion

Size of the cardiac sonographer workforce

The SCANZ2 audit is the first time in New Zealand that the number of cardiac sonographers working in public healthcare has been identified. New Zealand is a small country geographically, with a population of just over four million people, and as a result, the cardiac sonographer workforce is also small. NZ compares favourably to the UK when comparing the cardiac sonographer FTE per million of population. Based on the NZ population¹⁹ the FTE equivalent per million population is approximately 14. This is much higher than that seen in the UK which varies from 5 to 6 in Scotland and Wales, to 12 in Northern Ireland.²⁰ The UK data do not describe whether sonographer FTE included vacancies, whereas the SCANZ2 sonographer FTE did not include existing vacant FTE. As the number of vacancies in the UK²⁰ was much higher than those from the NZ SCANZ2 data, this may explain some of the difference. Although recruitment and retention of a small workforce can be an issue, the SCANZ2 data shows that the vacant FTE is relatively low at less than 10% of the sonographer FTE available.

There is a mismatch between the considerably fewer FTE provided to the scanning role compared to the total number of cardiac sonographers. It is unclear from the data whether this is due to the number of cardiac sonographers who work part-time or whether some proportion of the FTE is performed in other roles.

The number of sonographers undergoing training was approximately one quarter of the total sonographer FTE. Three of those defined as students (by qualification status) in the audit have significant echo experience (greater than five years) and are likely experienced sonographers who are up-skilling to an echo relevant qualification. This is consistent with international trends where formal professional qualifications are increasingly an expectation of healthcare professionals.

Table 5: Comparison of sonographer and medical radiation technologist (MRT) workforce in NZ and internationally.

	NZ		Australia		UK		USA		Canada	
	Sonographer	MRT	Sonographer	MRT	Sonographer	MRT	Sonographer	MRT	Sonographer	MRT
Licensed	Excluding cardiac	✓		✓		✓	New Mexico and Oregon	✓	Quebec and Alberta	Varies by province
Accredited/certified							✓			✓
Number of sonography specialties	1 (and one trainee)		6				6		3	
Job titles	Sonographer	Medical radiation technologist	Sonographer	Medical radiation scientist	Cardiac Physiologist	Diagnostic or therapeutic radiographer	Cardio-vascular technologist	Radiologic technologist	Sonographer	Medical radiation technologist
	Echo technologist		Cardiac technologist				Cardiac sonographer			
	Cardiac technologist						Diagnostic medical sonographer			
Definition of MRT includes sonographer	✓				✓		✓			
Professional registration or accreditation bodies	MRTB CPRB	MRTB	ASAR	AIR MRPBA	BSE SOR	SOR	ARDMS CCI	Varies by specialty	CARDUP Varies by province	CAMRT Varies by province

MRTB – Medical Radiation Technologist Board, CPRB – Clinical Physiologist Registration Board, ASAR – Australian Sonographer Accreditation Registry, AIR – Australian Institute of Radiography, MRPBA – Medical Radiation Practice Board of Australia, BSE – British Society of Echocardiography, SOR – Society and College of Radiographers, ARDMS – American Registry for Diagnostic Medical Sonography, CCI – Cardiac Credentialing International, CARDUP – Canadian Association of Registered Ultrasound Professionals, CAMRT – Canadian Association of Medical Radiation Technologists

Cardiac sonographer qualifications

The largest proportion of qualifications held is DMU Cardiac (Diploma of Medical Ultrasound) as was expected since DMU is the longest standing qualification available to NZ sonographers. The Graduate Diploma in Cardiac Ultrasound (QUT-PDG) is run by the Queensland University of Technology and enrolls NZ citizens as domestic students.²¹ Entry level for both DMU and QUT-PDG is a bachelor level degree.^{21,22} There is no cardiac ultrasound professional qualification provided by NZ based education providers. Currently only DMU and QUT-PDG are qualifications acceptable for registration as a cardiac sonographer with the MRTB.²³ Countries of origin of an overseas echo specific education were predominantly the UK, with some USA and South African qualifications.

Qualification information was not obtained for 19% of cardiac sonographers working in DHBs in NZ. The reasons for this are unknown but may relate to the absence of formal qualifications, or true omissions in data collection. Since each DHB had a single respondent for all cardiac sonographers working at that centre, then it is possible that qualification information may have been omitted if not readily known.

Although most DHBs perform a mixture of adult and paediatric scans there is no paediatric post-graduate level qualification either nationally or internationally. The European Association of Echocardiography (EAE) runs a certification

examination in congenital heart disease²⁴ and there is a paediatric echocardiography credential available through the American Registry of Diagnostic Medical Sonography (ARDMS)²⁵ in the USA but neither is recognised by NZ registration bodies.

Cardiac sonographer background

The high proportions of cardiac sonographers who come from a cardiac technological background demonstrate the close ties with the cardiac technology profession within NZ. Cardiac technologists continue to be a significant source for training into the sonographer role as the cardiac physiologist has valuable and transferrable knowledge and skills that are essential for a cardiac sonographer, including an in-depth knowledge of cardiac anatomy/haemodynamics and the ability to integrate clinical, haemodynamic and physiologic data.²⁶ In some centres, those performing cardiac ultrasound are employed as cardiac technologists and perform a variety of other non invasive and invasive cardiac technological procedures. Initially most of those performing cardiac ultrasound were cardiac technologists but in more recent years the separate profession of cardiac sonography has become established and in many larger centres cardiac sonographers are employed to perform only this role.

The role and background of cardiac sonographers in NZ is similar to Australia, the UK and the USA but largely different to Canada. In Australia, the overlap of the cardiac technological

and ultrasound roles seen in NZ also exists with some centres employing cardiac technologists to perform echo as well as other cardiac technical duties²⁷ and some centres employ only cardiac sonographers. In the UK, most cardiac sonographers are employed as cardiac physiologists and perform either/or invasive and non-invasive testing.²⁸ In the USA, although cardiac sonographers are under the umbrella title of Cardiovascular Technologist,²⁹ the cardiac sonographer role is generally a separate one and overall it is less common to perform other cardiac technical duties. In Canada, cardiac sonographers are employed and trained specifically for the role as a speciality of medical sonography.³⁰

Cardiac sonographer registration

Licensure in the form of compulsory registration of some healthcare professions is enforced in NZ. Licensure makes it illegal for unlicensed persons to perform acts within a lawfully defined scope of practice.³¹ *The Health Practitioners' Competency Assurance (HPCA) Act 2003*³² is controlled by the Ministry of Health (MOH) and the principal purpose is to protect the health and safety of the public by ensuring health practitioners are competent to practice. Professions which are regulated under the HPCA Act are those which have demonstrated risk of harm, or those which were already regulated under previous legislation. Examples of registered health professions include medical, nursing and some allied health professions such as chiropractic, medical laboratory science, physiotherapy and medical radiation technology. An additional assurance of public safety is the listing of specific activities that must be restricted to registered health professions. It is a requirement of registration to have a current annual practicing certificate (APC) to practice.

Cardiac sonographers in NZ are not required to register to practice as cardiac sonography is not a listed restricted practice, nor was it regulated under prior legislation (pre the HPCA Act), presumably on the basis that there is no proven risk of harm in diagnostic ultrasound. In comparison, non-cardiac sonographers are required to undergo compulsory registration with the MRTB to practice under the HPCA Act since they are members of the medical radiation technology profession³³ and prior to the HPCA Act, MRTs were regulated under the *Medical Auxiliaries Act 1966*³⁴ and the *Radiation Protection Act of 1965*.³⁵ The extension of registration into non-ionizing forms of medical imaging was probably based on professionals' boundaries rather than risk per se.

Although registration is not compulsory for cardiac sonographers, 70% have voluntarily registered with a professional body in NZ or Australia. In NZ, cardiac sonographers can obtain voluntary registration with either or both of the professional bodies (MRTB or CPRB), which list the scope of practice covering cardiac ultrasound. The CPRB ensures competency for clinical physiologists, scientists, technologists and technicians in the cardiology, respiratory and sleep sciences³⁶ and lists the echocardiography role under non-invasive procedures performed by the profession of cardiac technologists. The MRTB is responsible for administration of the HPCA Act 2003 in respect of the profession of medical radiation technology⁵ and has eight listed scopes of practice including sonographer and trainee sonographer.³³ Within healthcare this sharing of scopes

of practice by more than one profession is common practice.³⁷ Less than half of the cardiac sonographers who are registered with the MRTB meet the legislative requirements of the HPCA Act by holding a current APC. The cause of this is unknown but may relate to the differences in interpretation of the Act relating to cardiac sonographers by employers. NZ citizens performing cardiac sonography may also register with the ASAR³⁸ and most registered with ASAR have registration with a NZ registration body also.

The shared sonography scope and overall national alignment of cardiac sonographers with the profession of cardiac technology rather than medical radiation technology has created confusion and discord with the ownership and use of the title sonographer. The HPCA Act states that an unqualified person must not claim to be a Health Practitioner by names, words or title. By definition in the Act a Health Practitioner is "a person registered with a particular health profession"³². The MRTB regulates the profession of medical radiation technology and the regulated health practitioners they regulate under the Act are medical radiation technologists (MRTs) with different scopes of practice.⁵ The MRTB state that only those with current MRTB registration are able to use titles or suggest they are able to practice in the scopes of practice gazetted for the profession of medical radiation technology.³³ However, the HPCA Act does not list specific skills or activities to be restricted to a profession except those listed as restricted activities and does not list titles restricted to professions.

In other countries the legislation around restriction of title use is much clearer. The professional regulatory laws in British Columbia, a province of Canada, are very specific in that they list current reserved titles and state that it expressly prohibits a registrant other than from that regulatory authority from using the title or abbreviation of the title to describe the person's work.³⁹ In the UK the Health Professions Council (HPC) register 15 professions and the titles of diagnostic radiographer, radiographer and therapeutic radiographer are protected.¹¹ In Australia, the National Alliance of Self-Regulating Health Professionals (NASRHP) is aiming to implement reserve/protected title legislation to remove confusion around health practitioners versus unregulated workers.⁴⁰

Although professional licensing is voluntary at present for cardiac sonographers in NZ and most sonographers internationally, there are some advantages to this form of professional control. The main advantage proposed is patient safety.³¹ This is the principal purpose of the NZ HPCA Act and also all other professional organisations internationally that regulate, certificate or accredit their health professional workforce. In the situation of cardiac sonography within NZ there has not been adequate evidence to demonstrate that the use of ultrasound is dangerous or that public health could be compromised by unlicensed use.

Another advantage to licensing is its proposed ability to enhance the image of the profession and leads to professionalism. A profession is created when an occupation develops academic training, requirements for formal qualifications and regulatory bodies with powers to admit and discipline members.⁴¹ Waggoner, *et al.*²⁶ state that to be regarded as a professional the required minimal level of formal education should be a bachelor's degree

and professional-led certification exams. Although sonography is described as a profession in Australia, the UK, Canada and the USA it does not meet this definition of professional status due to either the lack of disciplinary power by the professional bodies that regulate it or from non-bachelor levels of formal education. The ASAR and BSE admit members who demonstrate a minimum level of education/experience but they do not have the power to review and censure the professional conduct of registrants.^{42,43} In contrast, the NZ MRTB does have this power,⁵ minimum entrance level is a bachelor's degree⁴⁴ and therefore MRTs and non-cardiac sonographers in NZ can be said to be called health care professionals. Licensing can also improve the education/training and continued learning of practitioners by the requirement of continuing professional development (CPD). CPD is an important way of ensuring that registered practitioners maintain up to date knowledge and skills to continue practising at a high level throughout their careers.⁴⁵ This is especially relevant in healthcare which has rapidly evolving technology and practices.

A final major advantage in professional licensing is its ability to provide information that can be used for future workforce planning. Experience in Australia has shown that professions regulated within a legislative framework have improved ability to identify and resolve workforce issues.⁴⁰ Voluntary registered professions can only collect member data leaving the rest of the profession inaccessible which impacts on workforce planning. The lack of compulsory legislative registration for cardiac sonographers in NZ makes information on the workforce difficult to collect and the profession has suffered in cohesive national planning relating to education, adequate representation and professional legislative advocacy.

There are some disadvantages with professional licensing which also need to be considered. Registration of professions in NZ under the HPCA Act gives professional regulatory authorities the authority to set scopes of practice and prescribe qualifications for the profession. When including a new profession or making changes to scope of practice there needs to be consideration of the impact on the existing workforce. Changes may compromise the supply of healthcare professionals or have economic effects and needs to be weighed against potential harm to the public.^{46,47}

Although there is an advantage in the improved education to healthcare professionals, there must be consideration of the availability and access of the required education to the profession as a whole. In NZ there is no NZ based cardiac sonography qualification and no post-graduate qualification available in the paediatric echocardiography speciality worldwide. There is significant cost with regard to overseas course costs and travel, which may affect accessibility to NZ students. There are also members of the existing workforce who will not meet existing registration entry criteria with the MRTB. Eight cardiac sonographers nationally (nearly 10% of the workforce) have physiology technologist qualifications as their highest professional qualification and a further 12 (14%) have an overseas qualification not currently acceptable for registration with the MRTB or CPRB. It is unknown what proportion of these has the requisite entry level educational requirements for entering DMU or QUT. All of these cardiac sonographers are very experienced (all have more than 5 years experience and

many have more than 15 years experience) and their age may make re-qualification prohibitive. To minimise the impact on the workforce, it is essential that legislation be introduced at the time of compulsory licensing which provides a long time for minimum qualifications to be met.⁴⁷

Licensing also comes with a cost to either the sonographer or employer. The formal cost of legislative regulation includes the one off application to the regulatory body for admittance and an annual APC with CPD requirements. This is usually achieved by attendance at conferences and or other educational forums and also in self-directed way. These mandatory costs add a significant cost burden to the public health sector. The other major cost involved with licensing comes from the cost of obtaining required qualifications. Other less obvious costs of compulsory licensing include time away from patient care complying with certification, employer HR system changes and potential legal costs.⁴⁸

Compulsory registration for cardiac sonographers in NZ may also limit the flexibility in the workforce, which would impact on service provision and patient care. Most cardiac sonographers in public health come from a cardiac physiology background but it is unknown how many are still routinely performing other non-sonography tasks in their roles. It is suspected that in smaller centres more cardiac sonographers perform more than sonography routinely. Compulsory registration may limit the flexibility in smaller centres to provide essential services by requirements of minimum numbers for maintenance of a license.

International experiences in registration

Internationally, most health professions are seeking inclusion in formal regulation and sonography is no exception. In Australia, the USA, Canada and the UK there have been on-going government or professional organisation led mandates to control cardiac sonography. All have argued for public safety as the primary motive in restricting practice to accredited, credentialed or licensed practitioners.^{9,40,41,47} In NZ the 2009 MOH review of the HPCA Act⁴⁸ revealed the concern that there was an increasing number of professions applying for inclusion into the Act and also a proliferation of registration bodies. The review proposed that any changes to regulation within the HPCA Act should reflect the same over-riding principles as the UK, Ontario and particularly Australia.⁴⁸ In Australia only one quarter of health professions are currently regulated but a further 20 professions have made submissions for inclusion.⁴⁰ The National Alliance of Self-Regulating Health (NASRHP) argues that current methods of self-regulation do not do enough to protect public safety and proposes that a single framework is used to regulate all health practitioners with titled practitioners to meet standards set by the professions self-regulation authority.⁴⁰ In the UK the Society of Radiographers (SOR) submitted to the Health Practice Council (HPC) to include regulation of sonographers which was accepted by the HPC but rejected by the Secretary of State for Health.⁹ In Ontario the Ontario Society of Diagnostic Medical Sonographers (OSDMS) has been pursuing the self-regulation of sonography in Ontario since 1983 without any resolution.⁴¹

More recently there has been a collaborative approach to the challenges of professional licensing internationally. In the USA, as a response to the introduction of licensing in Oregon

and New Mexico, proposed licensing in West Virginia and North Carolina and the Federal CARE bill (which may result in compulsory licensing of medical imaging procedures at a national level) there has been collaboration with other health professions to ensure that concerns of sonographers are heard and addressed.⁴⁷ In Australia, NASRHP is a forum made up of eight self-regulating allied health professional associations and is involved in modelling the regulation all health practitioners.⁴⁰ In Nova Scotia, the Nova Scotia Society of Diagnostic Medical Sonographers joined the Medical Radiation Technologists and Magnetic Resonance Technologists to work cooperatively and cohesively to request that the current act governing MRTs be reopened and that a new regulatory college be formed to license these three professions under one umbrella.⁴¹

In New Zealand both the MRTB and CPRB are attempting to include the cardiac sonographers' scope of practice into the HPCA Act. The MRTB have recently put out for consultation changes to scope of practice, which may make the compulsory registration of cardiac sonographers with the MRTB a reality.⁴⁹ Cardiac sonographers could be regulated under the HPCA Act by the MRTB as they already regulate non-cardiac sonographers, and have a sonography scope of practice. However, cardiac sonographers are not aligned with the medical radiation profession and have no representation on the MRTB. In the USA bills to license sonographers have been introduced in various states over the years – most without professional body representation or cardiac sonographer input and most have tried to link sonography in with Radiology professions for control by radiological professional bodies.³¹ The American Society of Echocardiography (ASE) does not believe that licensure for sonographers should be combined with licensure for other medical specialties.³¹ The CPRB continue to submit applications to the MOH for inclusion in the HPCA Act.⁵⁰ Indications from the MOH are that if this is accepted then it is likely to be included within an existing regulatory board. The latest inclusion to the HPCA Act was by the Anaesthetic Technicians who became regulated within an existing health regulatory authority – the Medical Laboratory Science Board accepted responsibility for regulating the two distinct health professions.⁵¹

A final route for consideration of registration of cardiac sonographers in NZ could be the inclusion of NZ cardiac sonographers into Australian regulation. The *Trans Tasman Mutual Recognition Act*⁵² is a bill that allows an individual who is registered in an Australian jurisdiction for an occupation the same entitlement in NZ. If Australian compulsory licensing of sonographers was established then since the ASAR currently recognises and accredits NZ cardiac sonographers these sonographers could potentially meet NZ requirements for registration.

Limitations

The SCANZ2 audit used to examine the cardiac workforce has limitations since the audit was designed primarily to assess the number of examinations performed regionally. This audit captures a snapshot in time (December 2010) and the workforce then may differ from the current workforce. In addition as the SCANZ2 audited only DHB providers the number of cardiac sonographers identified will be lower than that provided in the role throughout the country. Finally, the audit data identified a

difference in the number of sonographers nationally compared to the full time equivalent they provide to the role but it is not possible from the data available to determine the cause of this. Although 15% of sites reported performing foetal echocardiograms it is unknown whether this is performed by clinicians or sonographers, and does not include foetal echocardiography performed by non-cardiac sonographers.

Registration numbers were not reviewed at the same time as the SCANZ2 survey. The number of registered sonographers relates to numbers registered in March 2012 rather than December 2010 so direct comparison of registration of the same workforce as the SCANZ2 audit cannot be performed, although it is unlikely that significant changes have occurred.

Conclusion

The SCANZ2 audit is the first time that the cardiac sonography workforce in NZ has been identified at a national level. The size of the cardiac sonography workforce in NZ is small and this makes it a challenge for establishing independence from other professions. Although there are close ties of background with the cardiac technological profession and shared scope of practice with non-cardiac sonographers from radiological professions the cardiac sonographer role is unique enough to not fit adequately with either professional group.

Internationally the separate profession of cardiac sonography has been established despite the variety of roles performed and role titles used. Within NZ cardiac sonography is not represented separately, and the difference in both employment title and role has lead to confusion for cardiac sonographers and those who employ them. Furthermore the split of sonography into those who are regulated and those who are not has lead to difficulties employing overseas sonographers who get conflicting messages over requirements to practice in NZ.

As cardiac sonography is not a recognised separate profession in NZ there is no established national community and this lack of advocacy by cardiac sonographers has disadvantaged the profession. The ultimate goal for cardiac sonography as a profession in NZ should be to establish a national community to set minimum education and competency requirements. Registration would be an advantage if the professional registration body was inclusive of cardiac sonography representation and collaborative on decision making at all levels. It is important for the cardiac sonography community to drive future changes as Wagoner, *et al.*²⁷ states “if we continue to be passive about filling in the gaps of our standards and requirements and instead rely on others to define our position, we ultimately undermine our goal to be recognised as professionals and have no-one but ourselves to blame”.

Disclosure

Belinda Buckley is the Cardiac Representative on the CRPB.

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Appendix 1

SCANZ2 contributing regional centres

- Whangarei Hospital (Northland DHB)
- Northshore/Waitakere Hospitals (Waitemata DHB)
- Auckland City Hospital (Auckland DHB)
- Starship Hospital (Auckland DHB)
- Middlemore Hospital (Counties Manukau DHB)
- Waikato Hospital (Waikato DHB)
- Tauranga Hospital (Bay of Plenty DHB)
- Rotorua Hospital (Lakes DHB)
- Hawkes Bay Hospital (Hawkes Bay DHB)
- Gisborne Hospital (Tairāwhiti DHB)
- Taranaki Base Hospital (Taranaki DHB)
- Wanganui Hospital (Whanganui DHB)
- Wairarapa Hospital (Wairarapa DHB)
- Palmerston North (Mid central DHB)
- Hutt Hospital (Hutt Valley DHB)
- Wellington Hospital (Capital and Coast DHB)
- Nelson Hospital (Nelson Marlborough DHB)
- Christchurch Hospital (Canterbury DHB)
- Dunedin Hospital (Southern DHB)
- Invercargill Hospital (Southern DHB)

Appendix 2

SCANZ2 additional contributing centres

- Whakatane Hospital (served by Tauranga Hospital)
- Ashburton Hospital (served by Christchurch Hospital)
- Timaru Hospital (served by Christchurch Hospital)
- Wairau Hospital, Blenheim (served by Nelson Hospital)
- Kaitiaki Hospital (served by Northland DHB)
- Bay of Islands Hospital (served by Northland DHB)
- Dargaville Hospital (served by Northland DHB)
- Rawene (served by Northland DHB)